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10/737,139	12/15/2003	Jonathan Haswell	ARC920030095US1	6349

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EXAMINER	
LANIER, BENJAMIN E	

ART UNIT	PAPER NUMBER
2132	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/737,139	HASWELL, JONATHAN	
	Examiner	Art Unit	
	BENJAMIN E. LANIER	2132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed 02 April 2008 amends claims 8, 22, 30, and 34. Applicant's amendment has been fully considered and entered.

Response to Arguments

2. Applicant argues, "the proffered system and the device resulting from the combination of Velez-McCaskey, Rudoff, and Nishida impermissibly changes the principle of operation of Nishida." This argument is not persuasive because Nishida is not being modified. As stated by Applicant, "if the proposed modification or combination of the prior art would change the principle operation of the prior art invention ***being modified***, then the teachings of the references are not sufficient to render the claims *prima facie* obvious."

3. Applicant also contents that the proposed combination would change the principle operation of Velez-McCaskey, but failed to provide any evidence to support this allegation. Therefore, this argument is not persuasive.

4. Applicant's amendment to claims 8, 22, and 34, necessitated the new grounds of rejection in view of Styczinski, U.S. Patent No. 5,960,169

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 1-3, 5, 6, 9, 10, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, and further in view of Nishida, U.S. Patent No. 5,677,900. Referring to claim 1, Velez-McCaskey discloses a storage management system that automatically selects an appropriate RAID level for storage of files based on block size (Col. 10, lines 6-19), which meets the limitation of a policy manager comprising at least one rule relating to block-level storage for a RAID level of protection for a file stored on the plurality of storage units, the RAID level of protection being selected from a plurality of RAID levels of protection. The storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of at least one rule being based on an access pattern of files stored on the plurality of storage units, an access manager providing the policy manager with information relating to access patterns of files stored on the plurality of storage units. Velez-McCaskey does not disclose that the storage system stores information about each data block that indicates the number of files that require the data block for rebuilding. Rudoff discloses a storage system wherein when multiple files contain the same data block, only one copy of the shared data block is stored along with a reference value that indicates the number

of files that are associated with the data block (Abstract & Col. 3, lines 55-60), which meets the limitation of the filing system comprising information for each data block of the file indicating a number of files in the filing system that require the data block for rebuilding another file. It would have been obvious to one of ordinary skill in the at the time the invention was made to share data blocks in the storage management system of Velez-McCaskey, in the manner discussed in Rudoff, in order to minimize the storage space required when files contain the same data blocks as taught by Rudoff (Col. 3, lines 35-37). Rudoff does not disclose that the shared data blocks include parity information. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the shared data blocks to include parity information in order to provide error detection and correction when the data files are rebuild as taught by Nishida (Col. 1, lines 29-33).

Referring to claims 2, 3, Velez-McCaskey discloses that the RAID level for storage of each file is based on the file size (Col. 10, lines 14-15), which meets the limitation of the selected RAID level of protection is selected further based on size of the file, and on contents of the file.

Referring to claims 5, 6, Velez-McCaskey discloses that large files might be assigned to RAID-3, while small files would be assigned to RAID-5 (Col. 10, lines 15-18), which meets the limitation of at least two files are stored on the plurality of storage units having different RAID levels of protection, at least two files stored on a same storage unit have different RAID levels of protection.

Referring to claim 9, Velez-McCaskey discloses a storage management system that automatically selects an appropriate RAID level for storage of files based on block size (Col. 10,

lines 6-19), which meets the limitation of a RAID manager responsive to a rule contained in the policy manager by implementing the selected RAID level of protection for a file.

Referring to claim 10, Velez-McCaskey discloses the storage management system isolates regular backups from user intervention, thereby addressing problems associated with forgetful or recalcitrant employees who fail to execute backups regularly (Col. 2, lines 50-53), which meets the limitation of a RAID engine responding to the RAID manager by generating RAID redundancy type information for the file.

Referring to claim 12, Velez-McCaskey discloses that the storage devices could be hard drives (Col. 11, lines 41-42).

Referring to claim 13, Velez-McCaskey discloses that the storage devices could be SRAM (Col. 10, lines 51-57), which meets the limitation of at least one storage unit comprises a random access memory device.

Referring to claim 14, Velez-McCaskey discloses that the storage devices could be a CD-ROM drive (Col. 11, lines 41-42), which meets the limitation of at least one storage unit comprises an optical drive.

8. Claims 4, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900 as applied to claim 1 above, and further in view of Bright, U.S. Patent No. 7,085,819. Referring to claim 4, Velez-McCaskey discloses that the RAID level for storage of each file is based on the file size (Col. 10, lines 14-15), but does not mention file name or location. Bright discloses that the RAID level is determined based on file name and directory information (Col. 14, lines 45-67), which meets the limitation of the selected RAID

level of protection is selected further based on the name of the file and a location of the file in a name space of the filing system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the RAID level in the storage management system of Velez-McCaskey based on the file name and directory information in order to determine the RAID level based on how critical the data is as taught by Bright (Col. 15, lines 18-23).

Referring to claim 11, Velez-McCaskey does not mention storage capacity. Bright discloses that storage is selected based on capacity (Col. 14, lines 45-53), which meets the limitation of a space manager containing availability information for each storage block on the plurality of storage units. It would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain capacity information about the storage units in Velez-McCaskey so that storage can be determined based on the amount of storage space is available for each storage unit as taught by Bright (Col. 14, lines 45-53).

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900 as applied to claim 1 above, and further in view of Gotoh, U.S. Patent No. 6,223,300. Referring to claim 7, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), but does not mention determining the stripe size based on the file accesses. Gotoh discloses a disc array apparatus wherein the stripe size is determined based on file access information (Col. 5, lines 31-36), which meets the limitation of the information relating to access patterns of files is used for determining at least one RAID stripe size. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary

the stripe size, in Velez-McCaskey, based on the file access information, as described in Gotoh, in order to optimize the parameters set for access to the configured disks as taught in Gotoh (Col. 1, lines 43-54).

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, and further in view of Styczinski, U.S. Patent No. 5,960,169. Referring to claim 8, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of the information relating to access patterns of files is used for write coalescing data for storage on the plurality of storage units, but does not does not disclose that this is done between RAID stripes. Styczinski discloses relocating data in one stripe to a partially filled stripe (Col. 15, lines 11-20), which meets the limitation of the filing system coalesces data in a partially full RAID stripe with data from another RAID stripe to make unused space available . It would have been obvious to one of ordinary skill in the art at the time the invention was made for the data of Velez-McCaskey to be relocated to a partially filled stripe in order to provide sufficient storage space as taught by Styczinski (Col. 15, lines 11-20).

11. Claims 15-20, 24-26, 28-33, 35, 36, 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, further in view of Frey, U.S. Patent No. 6,742,137. Referring to claims 15, 26, 31, Velez-McCaskey discloses a storage management system wherein users can create and edit stored files within the storage systems

(Col. 11, lines 38-41), which meets the limitation of receiving a request at a filing system to create a file on the plurality of storage units, determining at a filing system that a file stored on the plurality of storage units should be updated. The storage management system automatically selects an appropriate RAID level for storage of files based on block size (Col. 10, lines 6-19), which meets the limitation of querying a policy manager for at least one rule relating to block-level storage for a RAID level of protection for the file created on the plurality of storage units, the RAID level of protection being selected from a plurality of RAID levels of protection, writing the file to the plurality of storage units based on the RAID level of protection selected for the file. The storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of at least one rule contained within the policy manager being based on an access pattern of files stored on the plurality of storage units. Velez-McCaskey does not disclose maintaining the RAID information in metadata. Frey discloses a fault tolerance system wherein metadata for each objects is maintained as a part of the object index (Col. 4, lines 6-7). The metadata describes storage locations for portions of the data object and includes fault tolerance information regarding a RAID level and storage information for the fault tolerance information (Col. 4, lines 8-21), which meets the limitation of maintaining metadata relating to a location of RAID information for the file within the filing system metadata information. It would have been obvious to one of ordinary skill in the art at the time the invention was made to store the RAID information in metadata in order to provide a fault tolerance technique that is flexible and allows for different fault tolerant techniques to be applied to different data objects on a single storage volume as taught by Frey (Col. 2, lines 47-58). Velez-McCaskey does not disclose that the

storage system stores information about each data block that indicates the number of files that require the data block for rebuilding. Rudoff discloses a storage system wherein when multiple files contain the same data block, only one copy of the shared data block is stored along with a reference value that indicates the number of files that are associated with the data block (Abstract & Col. 3, lines 55-60), which meets the limitation of the filing system comprising information for each data block of the file indicating a number of files in the filing system that require the data block for rebuilding another file. It would have been obvious to one of ordinary skill in the at the time the invention was made to share data blocks in the storage management system of Velez-McCaskey, in the manner discussed in Rudoff, in order to minimize the storage space required when files contain the same data blocks as taught by Rudoff (Col. 3, lines 35-37). Rudoff does not disclose that the shared data blocks include parity information. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the shared data blocks to include parity information in order to provide error detection and correction when the data files are rebuild as taught by Nishida (Col. 1, lines 29-33).

Referring to claim 16, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of providing the policy manager with information relating to access patterns of files stored on the plurality of storage units.

Referring to claims 17, 18, 35, 36, Velez-McCaskey discloses that the RAID level for storage of each file is based on the file size (Col. 10, lines 14-15), which meets the limitation of the selected RAID level of protection is selected further based on size of the file, and on contents of the file.

Referring to claims 19, 20, Velez-McCaskey discloses that large files might be assigned to RAID-3, while small files would be assigned to RAID-5 (Col. 10, lines 15-18), which meets the limitation of at least two files are stored on the plurality of storage units having different RAID levels of protection, at least two files stored on a same storage unit have different RAID levels of protection.

Referring to claim 24, Velez-McCaskey discloses a storage management system that automatically selects an appropriate RAID level for storage of files based on block size (Col. 10, lines 6-19), which meets the limitation of implementing the selected RAID level of protection for a file based on a rule contained in the policy manager.

Referring to claim 25, Velez-McCaskey discloses the storage management system isolates regular backups from user intervention, thereby addressing problems associated with forgetful or recalcitrant employees who fail to execute backups regularly (Col. 2, lines 50-53), which meets the limitation of generating RAID redundancy type information for the file.

Referring to claims 28, 38, Velez-McCaskey discloses that the storage devices could be hard drives (Col. 11, lines 41-42).

Referring to claims 29, 39, Velez-McCaskey discloses that the storage devices could be SRAM (Col. 10, lines 51-57), which meets the limitation of at least one storage unit comprise a random access memory device.

Referring to claims 30, 40, Velez-McCaskey discloses that the storage devices could be a CD-ROM drive (Col. 11, lines 41-42), which meets the limitation of at least one storage unit comprise an optical drive.

Referring to claim 32, Velez-McCaskey discloses a storage management system wherein users can create and edit stored files within the storage systems (Col. 11, lines 38-41), which meets the limitation of writing the file writes the file at the same place on the plurality of storage units that the file was located before the writing based on the selected RAID level of protection because no relocation is described as being involved with the editing process.

Referring to claim 33, Velez-McCaskey discloses that files can be relocated within the system (Col. 11, lines 42-51), which meets the limitation of writing the files writes the file at a different location on the plurality of storage units based on the selected RAID level of protection.

12. Claims 22, 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, in view of Frey, U.S. Patent No. 6,742,137, and further in view of Styczinski, U.S. Patent No. 5,960,169. Referring to claims 22, 34, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), which meets the limitation of the information relating to access patterns of files is used for write coalescing data for storage on the plurality of storage units, but does not does not disclose that this is done between RAID stripes. Styczinski discloses relocating data in one stripe to a partially filled stripe (Col. 15, lines 11-20), which meets the limitation of the filing system coalesces data in a partially full RAID stripe with data from another RAID stripe to make unused space available . It would have been obvious to one of ordinary skill in the art at the time the invention was made for the data of Velez-McCaskey to be relocated to a partially filled stripe in order to provide sufficient storage space as taught by Styczinski (Col. 15, lines 11-20).

13. Claims 21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, further in view of Frey, U.S. Patent No. 6,742,137 as applied to claim 15 above, and further in view of Gotoh, U.S. Patent No. 6,223,300. Referring to claims 21, 23, Velez-McCaskey discloses that the storage management system automatically relocates files within the system based upon frequency at which each file is accessed (Col. 11, lines 44-48), but does not mention determining the stripe size based on the file accesses. Gotoh discloses a disc array apparatus wherein the stripe size is determined based on file access information (Col. 5, lines 31-36), which meets the limitation of the information relating to access patterns of files is used for determining at least one RAID stripe size. It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the stripe size, in Velez-McCaskey, based on the file access information, as described in Gotoh, in order to optimize the parameters set for access to the configured disks as taught in Gotoh (Col. 1, lines 43-54).

14. Claims 27, 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Velez-McCaskey, U.S. Patent No. 6,098,128, in view of Rudoff, U.S. Patent No. 6,636,878, in view of Nishida, U.S. Patent No. 5,677,900, further in view of Frey, U.S. Patent No. 6,742,137 as applied to claims 15, 31 above, and further in view of Bright, U.S. Patent No. 7,085,819. Referring to claim 27, Velez-McCaskey does not mention storage capacity. Bright discloses that storage is selected based on capacity (Col. 14, lines 45-53), which meets the limitation of a space manager containing availability information for each storage block on the plurality of storage units. It would have been obvious to one of ordinary skill in the art at the time the invention was made to maintain capacity information about the storage units in Velez-McCaskey so that storage can be

determined based on the amount of storage space is available for each storage unit as taught by Bright (Col. 14, lines 45-53).

Referring to claim 37, Velez-McCaskey discloses that the RAID level for storage of each file is based on the file size (Col. 10, lines 14-15), but does not mention file name or location. Bright discloses that the RAID level is determined based on file name and directory information (Col. 14, lines 45-67), which meets the limitation of the selected RAID level of protection is selected further based on the name of the file and a location of the file in a name space of the filing system. It would have been obvious to one of ordinary skill in the art at the time the invention was made to determine the RAID level in the storage management system of Velez-McCaskey based on the file name and directory information in order to determine the RAID level based on how critical the data is as taught by Bright (Col. 15, lines 18-23).

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN E. LANIER whose telephone number is (571)272-3805. The examiner can normally be reached on M-Th 6:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron can be reached on 571-272-3799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Benjamin E Lanier/
Primary Examiner, Art Unit 2132